IN THE CLAIMS

1. (Previously Presented) Apparatus for inputting at least alpha-numeric information into a computer comprising:

a projector, projecting an image of at least part of a keyboard onto an inert surface;

a single two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens operative to image a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements, said single two dimensional sensor sensing user indicator interaction with specific locations on said image of at least part of a keyboard; and

at least alpha-numeric information generation circuitry employing an output from said single two dimensional sensor for providing an at least alpha-numeric output.

2. (Original) Apparatus according to claim 1 and also comprising a wireless communicator operative to provide said at least alpha-numeric output in a wireless manner to a receiver.

3. (Original) Apparatus according to claim 2 and wherein said wireless communicator comprises a cellular telephone.

4. (Previously Presented) Apparatus according to claim 3 and wherein said cellular telephone includes a housing, in which housing are mounted said projector, said single two dimensional sensor and said at least alpha-numeric information generation circuitry.

5. (Previously Presented) Apparatus according to claim 1 and also comprising a personal digital assistant.

6. (Previously Presented) Apparatus according to claim 5 and wherein said personal digital assistant includes a housing, in which housing are mounted said projector, said

single two dimensional sensor and said at least alpha-numeric information generation circuitry.

7. (Previously Presented) Apparatus according to claim 1 and wherein said at least one infrared illuminator is operative to direct infrared radiation over said image of at least part of a keyboard and said single two dimensional sensor also comprises at least one infrared sensor for sensing infrared light scattered from at least one user indicator.

8. (Previously Presented) Apparatus according to claim 2 and wherein said at least one infrared illuminator is operative to direct infrared radiation over said image of at least part of a keyboard and said single two dimensional sensor also comprises at least one infrared sensor for sensing infrared light scattered from at least one user indicator.

9. (Previously Presented) Apparatus according to claim 3 and wherein said single two dimensional sensor comprises at least one visible light illuminator, directing visible radiation over said image of at least part of a keyboard onto an inert surface and at least one visible radiation sensor for sensing visible light scattered from at least one user indicator.

10. (Previously Presented) Apparatus according to claim 4 and wherein said single two dimensional sensor comprises at least one visible light illuminator, directing visible radiation over said image of at least part of a keyboard onto an inert surface and at least one visible radiation sensor for sensing visible light reflected from at least one user indicator.

11. (Original) Apparatus according to claim 1 and wherein said user indicator is a user finger.

12. (Original) Apparatus according to claim 1 and wherein said user indicator is a user held stylus.

13. (Original) Apparatus according to claim 1 and wherein said projector comprises a

point light source illuminating a mask defining said image of at least part of a keyboard.

14. (Original) Apparatus according to claim 13 and also comprising a mirror directing light passing through said mask onto said inert surface.

15. (Previously Presented) Apparatus according to claim 13 and also comprising at least one lens directly receiving light from said point light source through said mask.

16. (Original) Apparatus according to claim 13 and wherein said point light source comprises a diode laser.

17. (Previously Presented) Apparatus according to claim 13 and wherein said mask is formed to define a distorted representation of said image of at least part of a keyboard in order to compensate for distortions in said projector.

18. (Original) Apparatus according to claim 13 and wherein said mask is a dynamically changeable mask.

19. (Previously Presented) Apparatus according to claim 1 and wherein said infrared illuminator comprises a cylindrical reflecting element receiving light from a point source and producing a generally flat, generally radially-directed light distribution.

20. (Previously Presented) Apparatus according to claim 8 and wherein said infrared illuminator comprises a cylindrical reflecting element receiving light from a point source and producing a generally flat, generally radially-directed light distribution.

21. (Previously Presented) Apparatus according to claim 9 and wherein said visible light illuminator comprises a cylindrical reflecting element receiving light from a point source and producing a generally flat, generally radially-directed light distribution.

22. (Previously Presented) Apparatus according to claim 10 and wherein said visible light illuminator comprises a cylindrical reflecting element receiving light from a point

source and producing a generally flat, generally radially-directed light distribution.

23. (Cancelled)

24. (Previously Presented) Apparatus according to claim 1 and wherein said single two dimensional sensor comprises an a position sensitive detector and at least one lens operative to image a region overlying each of a plurality of keyboard locations onto a corresponding region on said position sensitive detector.

25. (Previously Presented) Apparatus according to claim 7 and wherein said at least one infrared illuminator is operative to direct infrared radiation at a plurality of levels over said image of at least part of a keyboard and said at least one infrared sensor is operative to sense infrared light scattered from at least one user indicator at a plurality of locations therealong.

26. (Previously Presented) Apparatus according to claim 8 and wherein said at least one infrared illuminator is operative to direct infrared radiation at a plurality of levels over said image of at least part of a keyboard and said at least one infrared sensor is operative to sense infrared light reflected from at least one user indicator at a plurality of locations therealong.

27. (Previously Presented) Apparatus according to claim 9 and wherein said at least one visible light illuminator is operative to direct visible radiation at a plurality of levels over said image of at least part of a keyboard and said at least one visible radiation sensor is operative to sense visible radiation light scattered from at least one user indicator at a plurality of locations therealong.

28. (Previously Presented) Apparatus according to claim 10 and wherein said at least one visible light illuminator is operative to direct visible radiation at a plurality of levels over said image of at least part of a keyboard and said at least one visible radiation sensor is operative to sense visible radiation light reflected from at least one user indicator at a plurality of locations therealong.

29. (Original) Apparatus according to claim 1 and wherein said projector comprises a diffractive optical element, which when illuminated produces said image of at least part of a keyboard onto said inert surface.

30. (Original) Apparatus according to claim 1 and wherein said projector comprises a spatial light modulator, which when illuminated produces said image of at least part of a keyboard onto said inert surface.

31. (Original) Apparatus according to claim 30 and wherein said spatial light modulator comprises a dynamic spatial light modulator which is responsive to an electrical input for producing a dynamic image onto said inert surface.

32. (Previously Presented) Apparatus according to claim 1 and wherein:

said projector projects an image of at least part of a keyboard and of mouse functionality onto said inert surface; and

said single two dimensional sensor senses user indicator interaction with specific locations on said image of said mouse functionality.

33. (Previously Presented) Apparatus for inputting at least cursor-control information into a computer comprising:

a projector, projecting an image of at least part of mouse functionality onto an inert surface;

a single two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens operative to image a region overlying each of a plurality of mouse functionality locations onto a corresponding at least one of said array of discrete sensing elements, said single two dimensional sensor sensing user indicator interaction with specific locations on said image of at least part of mouse functionality; and

at least cursor control information generation circuitry employing an output from said single two dimensional sensor for providing an at least a cursor control output.

34. (Previously Presented) A wireless system for web browsing comprising:

a wireless communicator providing web browsing functionality; and

at least one projector mounted on said wireless communicator and projecting an image of a display onto a surface.

35. (Cancelled)

36. (Previously Presented) A wireless system for web browsing comprising:

a wireless communicator providing web browsing functionality;

at least one projector mounted on said wireless communicator and projecting an image of at least part of a keyboard onto a surface;

at least one two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens operative to image a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements, said at least one two dimensional sensor sensing user indicator interaction with specific locations on said image of at least part of a keyboard; and

at least alpha-numeric information generation circuitry employing an output from said at least one two dimensional sensor for providing an at least alpha-numeric output.

37. (Original) A wireless system for web browsing according to claim 36 and wherein said projector is also operative for projecting an image of a display onto a surface, whereby a user may readily view images produced during web browsing.

38. (Previously Presented) A wireless system for web browsing according to claim 37 and also comprising:

at least one two dimensional sensor, sensing user indicator interaction with specific locations on said image of said display; and

web browsing input circuitry employing an output from said at least one two dimensional sensor for providing an at least one web browsing output based on user

implemented actuation of locations on said image of said display corresponding to web links.

39-40. (Cancelled)

41. (Previously Presented) A wireless system for e-mail communication comprising:

a wireless communicator providing e-mail communication functionality;

at least one projector mounted on said wireless communicator and projecting an image of at least part of a keyboard onto a surface;

at least one two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens operative to image a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements, said at least one two dimensional sensor sensing user indicator interaction with specific locations on said image of at least part of a keyboard; and

at least alpha-numeric information generation circuitry employing an output from said at least one two dimensional sensor for providing an at least alpha-numeric output.

42. (Previously Presented) A wireless system for e-mail communication according to claim 41 and wherein said projector is also operative for projecting an image of a display onto a surface, whereby a user may readily view messages during e-mail communication.

43. (Previously Presented) A wireless system for e-mail communication according to claim 42 and also comprising:

at least one sensor, sensing user indicator interaction with specific locations on said image of said display; and

e-mail communication input circuitry employing an output from said at least one sensor for providing an at least one e-mail communication output based on user implement actuation of locations on said image of said display.

44-45. (Cancelled)

46. (Previously Presented) A wireless system for mobile commerce communication comprising:

a wireless communicator providing mobile commerce communication functionality;

at least one projector mounted on said wireless communicator and projecting an image of at least part of a keyboard onto a surface;

at least one two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens operative to image a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements, said at least one two dimensional sensor sensing user indicator interaction with specific locations on said image of at least part of a keyboard; and

at least alpha-numeric information generation circuitry employing an output from said at least one two dimensional sensor for providing at least an mobile commerce communication output.

47. (Original) A wireless system for mobile commerce communication according to claim 46 and wherein said projector is also operative for projecting an image of a display onto a surface, whereby a user may readily view images produced during mobile commerce communication.

48. (Original) A wireless system for mobile commerce communication according to claim 47 and also comprising:

at least one sensor, sensing user indicator interaction with specific locations on said image of said display; and

mobile commerce communication input circuitry employing an output from said at least one sensor for providing an at least one mobile commerce communication output based on user implement actuation of locations on said image of said display corresponding to web links.

49. (Previously Presented) A method for inputting at least alpha-numeric information into a computer comprising:

projecting an image of at least part of a keyboard onto an inert surface;

employing a single two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens for sensing user indicator interaction with specific locations on said image of at least part of a keyboard and imaging a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements; and

employing an output indicating sensed user indicator interaction for providing an at least alpha-numeric output.

50. (Original) A method according to claim 49 and also comprising providing said at least alpha-numeric output in a wireless manner to a receiver.

51. (Previously Presented) A method according to claim 49 and wherein said sensing comprises directing infrared radiation over said image of at least part of a keyboard on an inert surface and sensing infrared light scattered from at least one user indicator.

52. (Original) A method according to claim 49 and wherein said sensing comprises directing visible radiation over said image of at least part of a keyboard on an inert surface and sensing visible light scattered from at least one user indicator.

53. (Original) A method according to claim 49 and wherein said user indicator is a user finger.

54. (Original) A method according to claim 49 and wherein said user indicator is a user held stylus.

55. (Original) A method according to claim 51 and wherein said directing comprises reflecting light from a point source and producing a generally flat, generally radially-directed light distribution.

56. (Original) A method according to claim 52 and wherein said directing comprises reflecting light from a point source and producing a generally flat, generally radially-directed light distribution.

57. (Cancelled)

58. (Previously Presented) A method according to claim 49 and wherein said sensing comprises position sensitive detecting and imaging of a region overlying each of a plurality of keyboard locations onto a corresponding region on a position sensing detector.

59. (Previously Presented) A method according to claim 51 and wherein said directing includes directing infrared radiation at a plurality of levels over said image of at least part of a keyboard and said infrared sensing includes sensing infrared light scattered from at least one user indicator at a plurality of locations therealong.

60. (Original) A method according to claim 52 and wherein said directing includes directing visible radiation at a plurality of levels over said image of at least part of a keyboard and said visible sensing includes sensing visible light scattered from at least one user indicator at a plurality of locations therealong.

61. (Original) A method according to claim 49 and wherein said projecting comprises illuminating a diffractive optical element to produce said image of at least part of a keyboard onto said inert surface.

62. (Original) A method according to claim 49 and wherein said projecting comprises illuminating a spatial light modulator to produce said image of at least part of a keyboard onto said inert surface.

63. (Original) A method according to claim 62 and wherein said projecting comprises illuminating a dynamic spatial light modulator which is responsive to an electrical input

for producing a dynamic image onto said inert surface.

64-65. (Cancelled)

66. (Previously Presented) A method for wireless web browsing comprising:

providing web browsing functionality;

projecting an image of at least part of a keyboard onto a surface;

employing at least one two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens for sensing user indicator interaction with specific locations on said image of at least part of a keyboard and imaging a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements; and

generating an output useful in said web browsing functionality from said sensing for providing an at least alpha-numeric output.

67. (Original) A method for wireless web browsing according to claim 66 and wherein said projecting comprises projecting an image of a display onto a surface, whereby a user may readily view images produced during web browsing.

68. (Previously Presented) A method for wireless web browsing according to claim 67 and also comprising:

sensing user indicator interaction with specific locations on said image of said display; and

employing an output from said sensing for providing an at least one web browsing output based on user implemented actuation of locations on said image of said display corresponding to web links.

69-70. (Cancelled)

71. (Previously Presented) A method for wireless e-mail communication comprising:

providing e-mail communication functionality;

projecting an image of at least part of a keyboard onto a surface;

employing at least one two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens for sensing user indicator interaction with specific locations on said image of at least part of a keyboard and imaging a region overlying each of a plurality of keyboard locations onto a corresponding at least one of said array of discrete sensing elements; and

generating an output from said at least one two dimensional sensor for providing an at least alpha-numeric output useful in said communication functionality.

72. (Previously Presented) A method for wireless e-mail communication according to claim 71 and wherein said projecting comprises projecting an image of a display onto a surface, whereby a user may readily view messages during e-mail communication.

73. (Previously Presented) A method for wireless e-mail communication according to claim 72 and also comprising:

sensing user indicator interaction with specific locations on said image of said display; and

employing an output from said sensing for providing an at least one e-mail communication output based on user implemented actuation of locations on said image of said display.

74-75. (Cancelled)

76. (Previously Presented) A method for wireless mobile commerce communication comprising:

providing mobile commerce communication functionality;

projecting an image of at least part of a keyboard onto a surface;

employing at least one two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens for sensing user indicator interaction with specific locations on said image of at least part of a keyboard and imaging a region overlying each of a plurality of

keyboard locations onto a corresponding at least one of said array of discrete sensing elements; and

generating an output from said at least one two dimensional sensor for providing at least a mobile commerce communication output.

77. (Previously Presented) A method for wireless mobile commerce communication according to claim 76 and wherein said projecting comprises projecting an image of a display onto a surface, whereby a user may readily view images produced during mobile commerce communication.

78. (Previously Presented) A method for wireless mobile commerce communication according to claim 77 and also comprising:

sensing user indicator interaction with specific locations on said image of said display; and

employing an output from said sensing for providing an at least one mobile commerce communication output based on user implemented actuation of locations on said image of said display corresponding to web links.

79. (Previously Presented) A method according to claim 49 and wherein:

said projecting projects an image of at least part of a keyboard and of mouse functionality onto said inert surface; and

said sensing senses user indicator interaction with specific locations on said image of said mouse functionality.

80. (Previously Presented) A method for inputting at least cursor-control information into a computer comprising:

projecting an image of at least part of mouse functionality onto an inert surface;

employing a single two dimensional sensor comprising at least one infrared illuminator and also comprising an array of discrete sensing elements and at least one lens for sensing user indicator interaction with specific locations on said image of at least said mouse functionality and imaging a region overlying each of a plurality of

keyboard locations onto a corresponding at least one of said array of discrete sensing elements; and

generating an output from said single two dimensional sensor for providing an at least a cursor control output.

81. (New) Apparatus for inputting at least alpha-numeric information into a computer according to claim 1 and wherein said projector comprises a solid state light source which illuminates, via a negative lens, a mask which defines said image of at least part of a keyboard and also defines a mouse functionality including a touchpad and a pair of click buttons, said projector also comprising a mirror which directs light from said mask onto said inert surface.

82. (New) Apparatus for inputting at least alpha-numeric information into a computer according to claim 81 and wherein said solid state light source comprises a diode laser light source having natural astigmatism which obviates a need for a condensing lens upstream of said mask and said mask is pre-distorted in order to compensate for optical distortions in projection.

83. (New) Apparatus for inputting at least alpha-numeric information into a computer according to claim 82 and wherein said infrared illuminator comprises a solid state light source which directs light via a focusing lens and a mirror onto a cylindrical reflecting element which products radially directed illumination about a longitudinal axis of said cylindrical reflecting element and extends over 180 degrees, generally in a plane generally parallel to said inert surface, said radially directed illumination being characterized in that it has a relatively narrow spread in a direction generally perpendicular to said inert surface.

84. (New) Apparatus for inputting at least alpha-numeric information into a computer according to claim 83 and wherein said mask comprises a dynamic mask comprising a spatial light modulator.

85. (New) Apparatus for inputting at least alpha-numeric information into a computer according to claim 84 and wherein said illuminator comprises a line light source and a scanning mirror which reflects a line of light produced by said line light source in a direction generally perpendicular to the plane of said inert surface.